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IS 9992 (1991): Round and rectangular tinplate cans for liquid pesticides [MTD 32: Metal Containers]

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(पहला पुनरीक्षण)

Indian Standard

ROUND AND RECTANGULAR TINPLATE CANS FOR LIQUID PESTICIDES — SPECIFICATION

(First Revision)

UDC 621·798·144 : 669·6-41 : 632·95-404

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1991

Price Group 3

Metals Containers Sectional Committee, MTD 32

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Metals Containers Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1981 and based on the experience gained during this period, it was felt necessary to revise this standard in order to update it.

Whereas the basic requirements for the packaging of liquid pesticides have been covered in IS 8190 (Part 2) : 1988 'Liquid pesticides (*first revision*)' and IS 8190 (Part 3) : 1979 'Household pesticides', this standard covers only the specification for the round and rectangular tinplate containers for packing of the liquid pesticides recommended for packing in tin containers in these standards. Most of the liquid pesticides formulations are hazardous chemicals on account of their toxicity and flammability and the basic package of these products, therefore, calls for rigid quality and performance stardards. This standard covers the requirements of tinplate containers used for consumer retail packing of liquid pesticides.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 AUGUST 1994
TO
IS 9992 : 1991 ROUND AND RECTANGULAR TINPLATE CANS FOR LIQUID PESTICIDES — SPECIFICATION

(First Revision)

(*Page* 1, *clause* 2) — Substitute 'IS 193 : 1982 Soft solder (*fourth revision*)' *for* 'IS 193 : 1982 Soft solder (*third revision*)', and 'IS 1993 : 1993 Single cold-reduced tinplate and single cold-reduced blackplate — Electrolytic and hot-dipped tinplate sheet and blackplate sheet (*third revision*)' *for* 'IS 1993 : 1982 Cold-reduced tinplate and cold-reduced blackplate (*second revision*)'.

(*Page* 1, *clauses* 5.1 *and* 5.1.1) — Substitute 'IS 1993 : 1993' *for* 'IS 1993 : 1982'.

(*Page* 1, *clause* 5.1.2) — Substitute the following for the existing clause:

'5.1.2 The tinplate cans may be lacquered or unlacquered inside depending upon the compatibility of the product to be packed and given a protective/decorative coating on the outside.'

(MTD 32)

Reprography Unit, BIS, New Delhi, India

Indian Standard

ROUND AND RECTANGULAR TINPLATE CANS FOR LIQUID PESTICIDES — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements of round and rectangular tinplate cans for liquid pesticides of capacities ranging from 100 ml to 5 litres.

2 REFERENCES

The following standards have been referred in this standard:

IS No.	*Title*
193 : 1982	Soft solder (*third revision*)
1394 : 1984	Glossary of terms relating to metal containers (*third revision*)
1993 : 1982	Cold-reduced tinplate and cold-reduced blackplate (*second revision*)
2471 : 1963	Methods of test for metal containers
8393 : 1977	Roll seal pilferproof closures
8932 : 1978	Preformed metal screw caps for glass containers

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 1394 : 1984 shall apply.

4 DIMENSIONS AND TOLERANCES

The cans shall be manufactured to the dimensions and tolerances specified in Tables 1 and 2 read with Fig. 1 and 2 respectively.

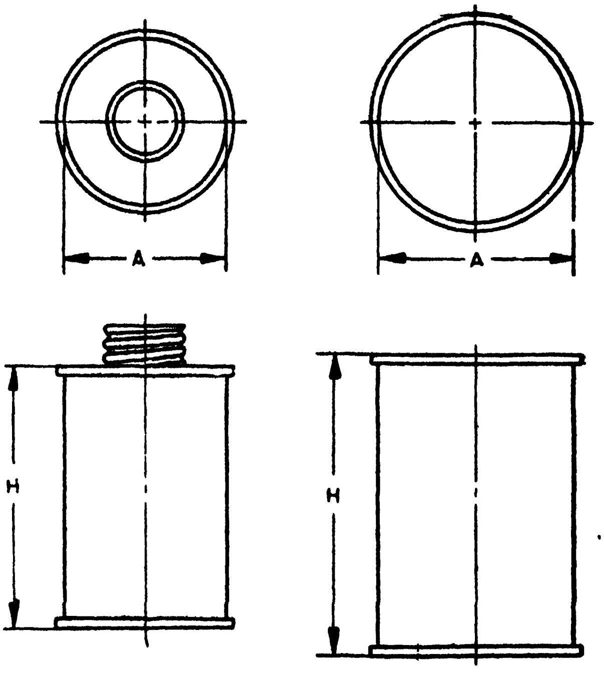
5 MATERIALS

5.1 Tinplate

The body and ends of the cans shall be made from tinplate of nominal thickness as given in Tables 1 and 2. Tolerances on nominal thickness of tinplate shall conform to IS 1993 : 1982.

5.1.1 The tinplate shall have a minimum tin coating of grade E 2.8/2.8 conforming to IS 1993 : 1982.

5.1.2 The tinplate shall be coated with a suitable lacquer on the inside and given a protective/decorative coating on the outside.



1A Round Can Without Handle

1B Round Can with Both Ends Closed

FIG. 1 ROUND CANS

5.2 The closure components shall be of tinplates of minimum thickness of 0·20 mm or of double reduced tinplate of minimum thickness 0·15 mm.

5.3 Solder

The solder used in the fabrication of cans shall be of grade Sn 2 or Sn 38 of IS 193 : 1982. Any other solder to be used shall be subject to agreement between the purchaser and the supplier.

6 MANUFACTURE

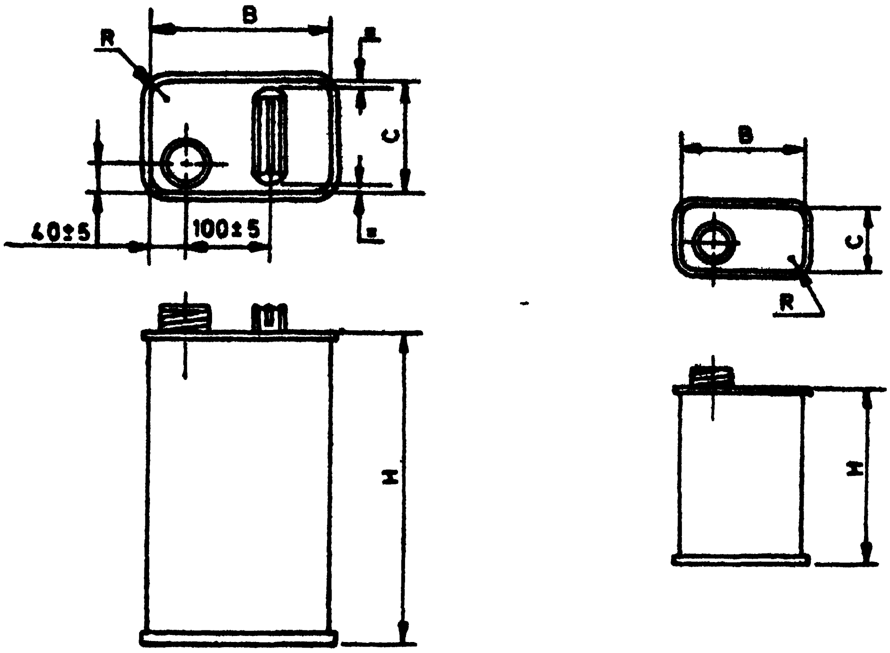
6.1 Side Seam Construction

6.1.1 The body shall be made from a single piece of tinplate.

6.1.2 The side seam shall be of lock seam (soldered) or lap seam (welded) construction.

6.1.3 *Side Stripe Lacquer*

The side stripe protective lacquer on the inside of welded side seam shall be applied to a width of minimum 20 mm along the whole length of



2A Rectangular Can with Handle 2B Rectangular Can Without Handle

All dimensions in millimetres.

FIG. 2 RECTANGULAR CANS

Table 1 Capacities and Dimensions of Round Pesticide Cans

(*Clause* 4.1, and *Fig.* 1A *and* 1B)

Can Ref	Nominal Capacity ml	Nominal Trade Size[1]	Nominal Internal Diameter of Can mm	Internal Diameter $A \pm 0{\cdot}2$ mm	Punch Plug Diameter[2] $\pm 0{\cdot}05$ mm	Height $H \pm 1{\cdot}0$ mm	Nominal Thickness[3] of Tinplate for Body mm	Nominal Thickness[3] of Tinplate for Ends mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	100	202	52	52·3	51·90	60 73[4]	0·20	0·20
2	250	301	74	74·1	73·76	70 80[4]	0·20	0·20
3	500	307	83	83·4	83·10	108 114[4]	0·20	0·20
4	1 000	404	105	105·1	104·95	133 143[4]	0·21	0·20
5	2 000	509	138	138·4	138·48	155 163[4]	0·24	0·24
6	4 000	700	174	174·1	174·45	203	0·26	0·26
7	5 000	700	174	174·6	174·45	251	0·27	0·27

[1] This trade size is being given here because the industry is currently more familiar with it as compared to metric nomenclatures. When the trade becomes familiar with metric nomenclature the trade sizes will be deleted.

[2] This deviation must not be confused with manufacturing tolerances. The deviation is not a manufacturing tolerance but is given to allow different sizes of punch plug to be used within a limited range. Punch plug diameter is given for the guidance of manufacturer and is not to be checked by the inspector for checking conformity of the can to this standard.

[3] Higher thickness may be used if agreed to between the purchaser and the supplier.

[4] Higher heights are for filling on automatic lines for higher foaming formulations and cans without necks.

Table 2 Capacities and Dimensions of Rectangular Pesticides Cans

(*Clause* 4.1, *and Fig.* 2A *and* 2B)

Can Ref	Nominal Capacity	Nominal Trade Size[1]	Nominal Internal Can Dimensions	Internal Can Dimensions $B \times C \pm 0{\cdot}1$ on Each	Corner Radius R	Nominal Overseam Height $H \pm 1{\cdot}0$	Minimum Nominal Thickness of Tinplate for Body	Top	Bottom
	ml		mm	mm	mm	mm	mm	mm	mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
8	100	213 × 112	69 × 42	68·8 × 41·5	13	51	0·22	0 25	0·22
9	250	213 × 112	69 × 42	68·8 × 41·5	13	108	0·22	0·25	0 22
10	500	312 × 115	93 × 47	92·7 × 46·5	15	140	0·22	0·25	0·22
11	1 000	410 × 209	114 × 61	114·1 × 61·2	16	168	0·22	0·26	0·22
12	3 000	700 × 406	175 × 108	175·1 × 108·1	16	178	0·24	0·26	0·24
		600 × 311	152 × 93	151·0 × 92·96	16	238	0·24	0·26	0·24
13	5 000	700 × 406	175 × 108	175·1 × 108·1	16	294	0·26	0·26	0·26

[1] This trade size is being given here because the industry is currently more familiar with it. When the trade becomes familiar with metric nomenclature, the trade sizes will be deleted.

welded areas. The cured lacquer shall be chemically resistant to the product. Application of side stripe lacquer is very critical and besides ensuring that the lacquer fulfils the provisions of **7.1.2** it shall be ensured that the inter-adhesion between the side stripe lacquer and the base lacquer is adequate.

6.2 End Seam

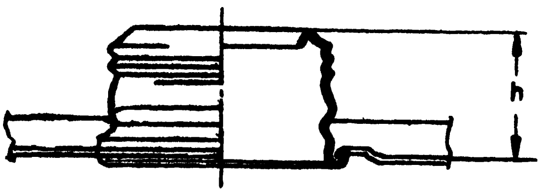
6.2.1 The bottom and top ends shall be joined to the body by a double seam with a sealing compound. The sealing compound shall be compatible with the product to be packed in the can and shall not show any product leakage through the compound lined seams within the normal storage.

6.3 Pouring System

6.3.1 The cans may be provided with a neck on the top or may be of open top type i.e. both ends closed.

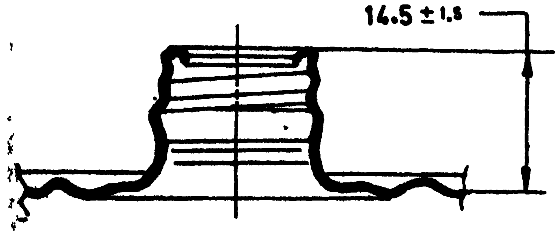
NOTE — Suitable pourers are available to be used with open top type cans to facilitate pouring.

6.3.2 Metal neck component shall be mechanically crimped to top end and shall be subsequently soldered to give leakproof joint. Alternatively the neck may be an integral part of the top end in which no soldering is required. Critical dimensions of the neck components are given in Fig. 3.



Neck Height for RSPP Closure		Neck Height for Pre-screwed Closure	
Size of Closure	$h \pm 1{\cdot}5$	*Size of Closure*	$h \pm 1{\cdot}5$
mm	mm	mm	mm
25	20·5	25	14·5
31·5	22	38	20
38	20·5		

SOLDERED NECK



INTEGRAL NECK FOR 25 mm CLOSURE

All dimensions in millimetres.

FIG. 3 NECK

6.4 Closure

The recommended closures used for each can size are given in Table 3.

Table 3 Recommended Closure and Other Fitments for Pesticide Tins

(*Clause* 6.4)

Can Ref	Nominal Capacity and Shape of Cans	Screwed Neck With Inner Seal (*See* Note 1) and Pre-screwed Cap (*See* IS 8932 : 1978)		Roll Seal Pilferproof Neck, RSPP Closure With or Without Inner Seal (*See* IS 8393 : 1977)			Open Top Type Cans	Handle
		38 mm	25 mm	25 mm	31·5 mm	38 mm		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1,8	100-ml round and rectangular	X	√	√	X	X	√	X
2,9	250-ml round and rectangular	X	√	√	√	X	√	X
3,10	500-ml round and rectangular	X	√	√	√	X	√	X
4,11	1-litre round and rectangular	√	X	X	X	√	√	X
5	2-litre round	√	X	X	X	√	√	X
6	4-litre round	√	X	X	X	√	√	√
7	5-litre round	√	X	X	X	√	√	√
12 & 13	3 and 5 litre rectangular	√	X	X	X	X	X	√

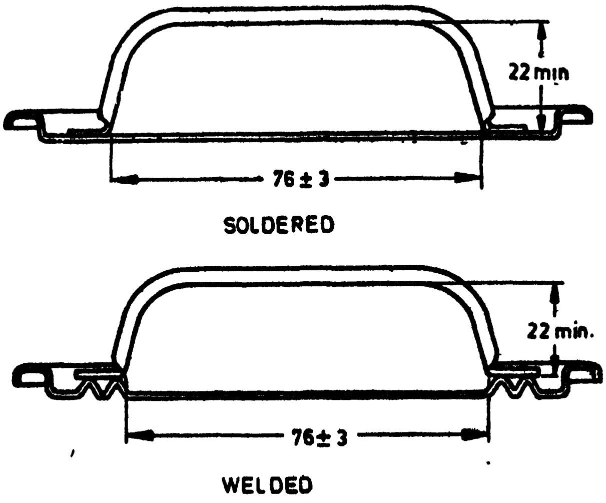
NOTES

1 Inner seal may be of tinplate lined on the outer side preferably with aluminium foil/polyaminate or paper polyaminate or suitably designed low density polyethene plug.

2 '√' denotes recommended and 'X' denotes not recommended.

6.5 Handle

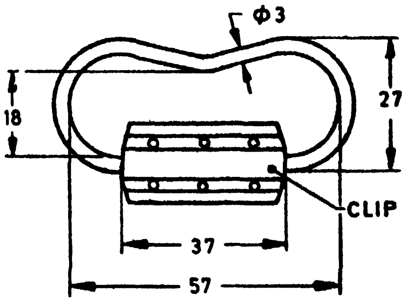
6.5.1 The 5-litre rectangular cans shall be fitted with strap handle of tinplate of minimum 0·26 mm thickness as shown in Fig. 4. The handle shall be either soldered or welded to the can top in the position as shown in Fig. 4.



All dimensions in millimetres.

FIG. 4 STRAP HANDLE

6.5.2 The four and five litre round cans shall be either fitted with strap handle as specified in 6.5.1 or with wire drop handle of the shape and dimension as shown in Fig. 5.



All dimensions in millimetres.

FIG. 5 WIRE DROP HANDLE

7 WORKMANSHIP AND FINISH

7.1 Internal Finish

The internal surface of the can including bod side seam, neck and ends shall be given chemically resistant protective lacquer coatin

7.1.1 The lacquer system shall be proper cured to withstand adhesion test when test according to the method described in Annex A

7.1.2 The lacquer system shall be compatib with the product packed and shall be able withstand the product throughout its expect storage period. The compatibility shall tested according to the test method describ in Annex B or as agreed to between the pestici packer and the can manufacturer.

7.2 External Finish

7.2.1 The outside of the top and bottom of t container shall be given a suitable protecti finish which shall be resistant to the product.

NOTE — The neck and handle and a small area adjacent to them would necessarily remain unprotected since it is not feasible to have a protective finish in these areas on account of the soldering operation involved.

7.2.2 The cans when delivered shall be in new and clean condition both inside and outside and shall be free from rust and foreign matters.

8 PERFORMANCE TESTS

8.1 Each can shall withstand the following performance tests.

8.1.1 *Air Pressure Leakage* (*Without Closure Applied*)

The can, when subjected to an air pressure of 15 kPa (0·15 kg/cm^2) shall show no sign of leakage when immersed in water for 15 seconds (*see* IS 2471 : 1963).

8.1.2 *Liquid Leakage Test* (*With Closure Fitments Applied*)

The can filled with the product or water and sealed with closure shall not show any external signs of product leakage when kept upside down for 30 minutes under ambient conditions.

8.1.3 *Handle Pull Test*

The handle of the can when tested shall be capable of withstanding a pull of 10 kgf for a period of two minutes (*see* IS 2471 : 1963).

9 MARKING

9.1 The manufacturer's name, initials or recognized trade-mark and year of manufacture may be clearly and indelibly marked or embossed on the cans, if required by the purchaser.

9.1.1 The cans may also be marked with the Standard Mark.

ANNEX A

(*Clause* 7.1.1)

LACQUER CURING TEST

A-1 The curing and adhesion of internal lacquer on the body and bottom is determined by rubbing 20 times the lacquered surface with cotton wool soaked in acetone (one up and down rubbing is equivalent to two times rubbing).

A-2 Lacquer shall not lift from the surface and the cotton wool shall remain colourless.

NOTE — This being a subjective test, a can with lacquer system of known performance is used as control.

ANNEX B

(*Clause* 7.1.2)

LACQUER-PRODUCT COMPATIBILITY TEST

B-1 PRINCIPLE

B-1.1 The product is filled in the cans and the filled cans are stored at a fixed temperature for a fixed period as agreed to between the can manufacturer and the user. The condition of the lacquer is visually examined for any damage. With this test, the product packed in glass bottle and stored simultaneously should serve as a reference for comparing the product quality.

B-2 PRODUCT COMPATIBILITY

B-2.1 The contents of the product after the storage test should be as close as possible to that of the sample kept in glass bottles.

B-3 LACQUER COMPATIBILITY

B-3.1 After the observations in B-2.1, the contents are emptied, the cans are cut open and washed. The lacquered surface is dried with dry cotton wool and examined.

B-3.1.1 There shall be no softening, lifting, peeling or blistering of the lacquered surface.

B-3.1.2 Slight fracture of lacquer at the neck and side seam fold is inevitable and may be accepted.

NOTE — For the accelerated storage test the most appropriate temperature and storage schedule are under study and will be incorporated later on. Some of the pesticide manufacturers have suggested storage at 50°C for a maximum period of 12 weeks, with intermediate openings after 3 and 6 weeks.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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